REMARKS/ARGUMENTS

Claims 39-45 and 47-80 are presently pending in this case. Claims 57-77 are withdrawn but are retained and amended for the Office's consideration of rejoining these non-elected claims to the elected claims upon agreeing that the elected subject matter is allowable.

Claims 39 and 54 are amended to define that the DL matrix material is silicon, silicon carbide, copper, aluminum, and/or silver based on the disclosure on page 5, 1st paragraph of the originally filed application.

No new matter is added.

The rejection applied under 35 USC 103(a) combining Saito and Zhu does not teach or suggest the claimed invention.

As amended the matrices for the DL material are ones which do not dissolved diamond, i.e., as defined in the claims the matrix material is silicon, silicon carbide, copper, aluminum, and/or silver. As explained previously, for Zhu's method to work, the substrate which includes diamond grains has to be a transition metal and capable of dissolving carbon (see col. 3, lines 5-10; col. 5, lines 63-64). Silicon, silicon carbide, copper, aluminum, nor silver meet both of these requirements in Zhu. Rather, these materials are selected so as to NOT dissolve the diamond, the exact opposite of Zhu.

Saito describes a method of making a heat sink by forming a thin diamond layer on a sintered compact containing Cu and W. There is no disclosure whatsoever of a diamond loaded material or of CVD diamond. At best Saito an example of a thin diamond layer (10-200μm) used as a heat sink. Thus, as outlined on page 2 of the Action, Zhu is cited to fill-in the deficiency of Saito as it relates to CVD grown layer epitaxially bonded to a substrate.

As explained previously, in Zhu's Figure 2 there is no disclosure for diamond. It discloses a carbon-containing powder 22 (NOT diamond) deposited onto the nickel substrate 15 (see, e.g., col. 7, lines 16-24 of Zhu). These carbon containing powder seeds 22 "dissolve into the surface of the substrate forming molten areas of Ni-C-H (column 7, lines 22-24) which then solidify to form so-called "solidified intermediate states 23" which are a Ni-C-H solid solution. Diamond then nucleates on the C-rich solid solution regions. The only diamond present in Figure 2 is therefore diamond formed on the surface.

Figure 3 of Zhu shows diamond seeds 22 which are completely dissolved into the Ni lattice, with the carbon remaining highly concentrated in the regions 23 where the diamond seeds are originally located and forming a Ni-C-H solid solution (see col. 7, lines 40-45). Diamond 30 then nucleates ON the surface of those regions 23 (Figure 3C and column 7, lines 38-48). Once the diamond seeds have completely dissolved in the Ni lattice they simply provide carbon atoms in the lattice and are no longer "diamond". Therefore as with the Figure 2 embodiment, the only diamond in the grown part is on the surface of the nickel substrate and it does not disclose a "diamond loaded material" as required by in the present claims.

Figure 4 of Zhu is similar to Figure 3 but shows only partial dissolution of the diamond seeds from which diamond then grows. Zhu is completely silent as to the size of the "diamond seeds", but in the context of the application, where these are forming nuclei for diamond growth (in a similar manner to the dissolved carbon or diamond described with reference to Figures 2 and 3), one would understand that these would be very small indeed, of the order of the nuclei used in Deguchi, discussed at length earlier in the prosecution of this application. In this respect it should be noted that Figures 2, 3 and 4 are put forward by Zhu as alternative possible nucleation models. While the Figure 4 model does disclose some residual diamond seed prior to further diamond growth, theses seeds are similar to the

seeding nuclei of Deguchi, and Applicants submit it is not correct to interpret this as a "diamond loaded material" as required in the present claims. Further, there is certainly no disclosure or suggestion in any of the models put forward by Zhu (including the Figure 4 model) of providing a diamond loaded material with a surface with exposed diamond particles having a diameter of at least 10 μm, as required by independent claim 39.

Also there is not disclosure in Zhu of the grain size of the exposed surface of the CVD diamond layer being at least four times a thickness of the CVD layer as required by independent claim 39 of our application.

Thus, in combination, the cited art simply does not teach or reasonably suggest a layer of CVD diamond grown onto a diamond loaded (DL) material.

The claimed exposed diamond particles in the DL layer composed of silicon, silicon carbide, copper, aluminum, and/or silver, having a particle size of at least 10 μm generate a CVD layer with a grain size of at least 4 times the CVD layer thickness, resulting in a unique and new thin, but large grain size CVD layer, the grain size being large not only through the bulk of the CVD layer, but also at the nucleation surface of the CVD layer (i.e. at the DL/CVD layer interface). This may be advantageous for various reasons, e.g. because typically the larger the grain size the higher the coefficient of thermal conductivity).

Furthermore, the references reveals that rather than teaching the claimed invention, the cited art teaches away from it. The requirement of Zhu is that the substrate is a transition metal that is capable of dissolving carbon. What motivation could there be to add diamond to the bulk of the substrate when it will be, at least partially if not completely, dissolved during the pre-synthesis treatment process? The preferred substrate in Zhu is a single crystal substrate so as to obtain the alignment between the diamond grains that Zhu seeks to achieve. In this condition, the substrate is not a diamond-loaded substrate. Adding diamond grains to the nickel single crystal to make it diamond loaded and then heat treating the substrate will

result in a multi-phase material that would not be a single crystal. Therefore, Zhu teachings direct one away from, rather than towards, the claimed invention. see MPEP § 2141.02 (prior art must be considered in its entirety, including disclosures that teach away from the claims).

Reconsideration and withdrawal of the rejection is requested.

A Notice of Allowance is also requested.

Respectfully submitted,

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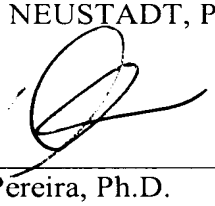

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